[CLAIMS]

[Claim 1]

A method of forming a porous coating layer on mother material, comprising:

providing the mother material;

feeding powder having a metal composition, which includes at least two different metals selected from the group consisting of Al, Mg, Zn, and Sn and which is expressed by $xA-(1-x)B$ ($0<x<1$, x is a weight ratio of A and B), onto the mother material;

supplying high pressure gas to the powder;

applying the metal powder on the mother material by spraying the metal powder using the high pressure gas through an supersonic nozzle; and

heat-treating the coated mother material to form the porous coating layer.

[Claim 2]

The method as set forth in claim 1, wherein the powder having the metal composition includes alloy powder of at least two metals selected from the above group.

[Claim 3]

The method as set forth in claim 1, wherein A is Al, and B includes a metal element selected from the group consisting of Mg, Zn, and Sn.

【Claim 4】

The method as set forth in claim 1, wherein the supplying of the high pressure gas comprises:

compressing gas; and

pre-heating the compressed gas.

【Claim 5】

The method as set forth in claim 1, wherein the heat-treatment of the coated mother material is conducted at a temperature between a eutectic temperature of A and B and a melting point of a metal having the higher melting point of A and B.

【Claim 6】

The method as set forth in claim 1, wherein the heat-treatment of the coated mother material is conducted at about 200 - 650℃.

【Claim 7】

The method as set forth in claim 1, wherein the feeding of the powder further comprises changing x to change the composition of the powder.

【Claim 8】

The method as set forth in claim 1, wherein the gas

includes any one selected from the group consisting of helium, nitrogen, argon, and air.

【Claim 9】

A metal coated member, comprising:

metal mother material; and

a coating layer formed on the metal mother material, which includes at least two metal elements and is expressed by xA-(1-x)B (x is a weight ratio of A and B),

wherein, A and B are different metals selected from the group consisting of Al, Mg, Zn, and Sn, x changes when moving in a thickness direction of the coating layer within a range of $0< x <1$, and porosity of the coating layer is changed depending on a change in x.

【Claim 10】

The metal coated member as set forth in claim 9, wherein x increases or decreases moving in a thickness direction of the coating layer, and the porosity of the coating layer is increased or decreased as x is increased or decreased.

【Claim 11】

The metal coated member as set forth in claim 10, wherein A is Al, B is any one metal selected from the group consisting of Mg, Zn, and Sn, and x is decreased and the

porosity of the coating layer is increased moving from an interface of the metal mother material and the coating layer to a surface of the coating layer.

【Claim 12】

A metal coated member, comprising:

metal mother material; and

a coating layer formed on the metal mother material, which includes at least two metal elements and is expressed by A-B,

wherein, A and B are different metals selected from the group consisting of Al, Mg, Zn, and Sn, A or B selected from the above group changes when moving in a thickness direction of the coating layer, and porosity of the coating layer is changed depending on a change in A or B.

【Claim 13】

The metal coated member as set forth in claim 9 or 12, wherein the coating layer includes open pores which are at least partially interconnected with each other.

【Claim 14】

The metal coated member as set forth in claim 13, wherein the open pores exist in an upper part of the coating layer.

【Claim 15】

A method of forming a porous carbon coating layer on mother material, comprising:

providing the mother material;

feeding carbon powder which is conglomerated by an organic binder;

supplying high pressure gas to the carbon powder; and

applying the carbon powder on the mother material by spraying the carbon powder using the high pressure gas through a supersonic nozzle.

【Claim 16】

The method as set forth in claim 15, further comprising burning out the organic binder at 400 - 500℃ after the application of the carbon powder.